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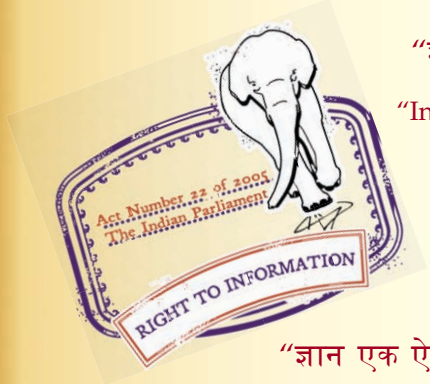

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IS : 1480 - 1970
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Indian Standard

SPECIFICATION FOR METRIC SCALES FOR GENERAL PURPOSES

(First Revision)

Fourth Reprint JANUARY 2001

UDC 744.341 : 531.716.1

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Gr 3

April 1971

AMENDMENT NO. 1 OCTOBER 1977

TO

IS:1480-1970 SPECIFICATION FOR METRIC SCALES FOR GENERAL PURPOSES

(First Revision)

Alteration

(Page 4, clause 2.2.2, second sentence) - Substitute the following for the existing sentence:

'The maximum moisture content of the timber shall be between 8 and 12 percent.'

(EDC 36)

Printed at New India Printing Press, Khurja, India

AMENDMENT NO. 2 DECEMBER 1982

TO

IS:1480-1970 SPECIFICATION FOR METRIC SCALES FOR GENERAL PURPOSES

(First Revision)

Alterations

(*Page 4, clause 2.3.1 and Note*) - Substitute the following for the existing clause and note:

'2.3.1 The material for the manufacture of plastic scales shall be rigid polystyrene, polymethyl methacrylate (acrylic), rigid polyvinyl chloride or polyvinyl chloride copolymer sheets.'

(*Page 5, clause 3.1.2, line 3*) - Substitute '1 mm' *for* '0.5 mm'.

(*Page 9, Table 2, heading of last column*) - Substitute '*t*' *for* '*c*'.

Addendum

(*Page 5, clause 3.2.2*) - Add the following new sentences at the end of the clause:

'Brass sheets shall be used for central wheel and for central and vertical hinges. The pins required for central/vertical hinges and at other places shall be made of brass or other non-corrodable material.'

(EDC 36)

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SPECIFICATION FOR METRIC SCALES FOR GENERAL PURPOSES

(First Revision)

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Indian Standard

SPECIFICATION FOR METRIC SCALES FOR GENERAL PURPOSES

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 28 October 1970, after the draft finalized by the Optical and Mathematical Instruments Sectional Committee had been approved by the Mechanical Engineering Division Council.

0.2 This Standard was first published in 1960 and has now been revised for metricization due to complete changeover to metric system in India.

0.3 This standard recognizes wooden scales of denominations 10, 15, 20, 30, 50 and 100 cm and plastic scales of denominations 10, 15, 20 and 30 cm. Wooden scales of denominations 50 and 100 cm may be designed either end measuring or edge measuring. When intended to be used as end measuring, the scales may be designed either foldable or rigid whereas when intended for use as edge measuring, the scales shall be designed rigid only. The type of scale required should, therefore, be indicated clearly in the enquiry or order.

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard prescribes the requirements for rigid and foldable metric scales, made of wood or plastic materials, for general purposes. It covers end measuring as well as edge measuring scales.

2. MATERIAL

2.1 The scales shall be made from strips or sheets of wood or plastic which shall be uniform in width and thickness throughout the entire length.

---

*Rules for rounding off numerical values (*revised*).

2.2 Wooden Scales

2.2.1 The wooden scales shall be of two qualities, namely, Grade A and Grade B, and shall be made of any one of the following species of timber:

Trade Name	Botanical Name
	For Grade A Scales
Boxwood	*Buxus sempervirens* Linn.
Gardenia	*Gardenia* sp.
Parrotia	*Parrotia jacquemontiana* Deene.
Dudhi	*Wrightia* sp.
Horse chestnut	*Aesculus indica* Colebr.
	For Grade B Scales
Haldu	*Adina cordifolia* Hook. f.
Kurchi	*Holarrhena antidysenterica* Wall.
Kaim	*Mitragyna parvifolia Roxb.* Korth.
Kuthan	*Hymenodictyon excelsum* Wall.
Gamari	*Gmelina arborea* Linn.

2.2.2 The timber shall be thoroughly seasoned and radially sawn. The moisture content of the timber shall be between 8 and 12 percent. The timber shall be free from knots, cracks, sapwood, shakes and other visible defects, such as decay, insect attack, and shall be fairly straight grained.

2.3 Plastic Scales

2.3.1 The material for the manufacture of the plastic scales shall be polyvinyl chloride or polyvinyl chloride copolymer sheets or strips or any other suitable plastic material.

NOTE — The question of preparing Indian Standards for materials suitable for this purpose is under consideration of the appropriate committee.

2.3.2 The plastic strips or sheets shall be smooth and even on all sides and free from blisters, porosity and other defects.

3. MANUFACTURE

3.1 General

3.1.1 The scales shall be straight and flat with edges parallel to each other and ends square.

3.1.2 The edges of the scales shall not deviate from a straight line by more than 0·5 mm and their plane surfaces shall not vary from a plane by more than 0·5 mm at any point.

3.1.3 The surfaces and edges of the scales shall be smoothly finished and polished.

3.2 Wooden Scales

3.2.1 The wooden scales shall be made of flat sections with two bevelled edges except in the case of 50-cm and 100-cm scales which shall be made of rectangular sections. The edge measuring scales shall be rigid only whereas the end measuring scales may be either foldable or rigid.

3.2.2 Foldable scales shall consist of four pieces hinged together and shall be graduated as end measuring scales. The joints shall work smoothly without undue play and shall be sufficiently free so that the various sections may be opened and closed without undue effort. On either end of foldable scales, brass caps shall be provided which shall be secured firmly to the scale and shall be flush with the sides of the scales.

3.3 Plastic Scales — The plastic scales shall be made of flat sections with two bevelled edges. They shall be manufactured in denominations of 10, 15, 20 and 30 cm.

4. DIMENSIONS

4.1 Wooden Scales — The principal dimensions of the rigid and foldable wooden scales shall be as given in Tables 1 and 2 respectively.

4.2 Plastic Scales — The principal dimensions of the plastic scales shall be as given in Table 3.

5. GRADUATIONS

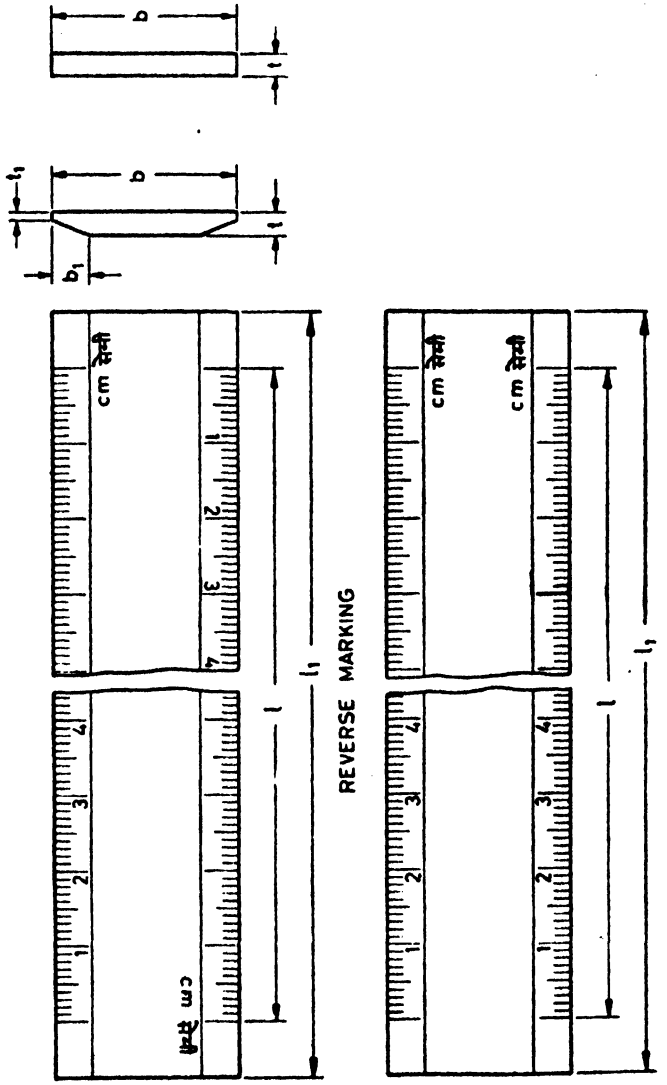
5.1 Rigid scales, wooden or plastic, shall be graduated on one face on both the edges in such a manner that the top edge of the scale reads from left to right (reverse marking).

5.1.1 Rigid scales, wooden or plastic, may also be graduated on one face on both the edges in such a manner that both the edges of the scale read from left to right (unidirectional marking).

5.2 Foldable scales shall be graduated as end measuring scales on both faces on the lower edge only to read from left to tright over the various sections and the edges shall be so manufactured that the reading is not obstructed by joints or is rendered inaccurate.

TABLE 1 PRINCIPAL DIMENSIONS OF WOODEN RIGID SCALES

(Clause 4.1)



*Type	l	l_1		b		t	b_1	t_1
		Max	*Min*	*Max*	*Min*			
	cm	cm	cm	mm	mm	mm	mm	mm
G	10	11·0	10·5	27	22	3 ± 0·5	5 ± 1	1
G	†15	16·5	16·0	27	22	3 ± 0·5	5 ± 1	1
G	20	21·5	21·0	27	22	3 ± 0·5	5 ± 1	1
G	30	32	31·5	32	27	4 ± 0·5	5 ± 1	1
G	50	52	51	32	27	6 ± 1	—	—
D	50	50	—	32	27	6 ± 1	—	—
G	100	102	101	32	27	6 ± 1	—	—
D	100	100	—	32	27	6 ± 1	—	—

*'G' stands for edge measuring type and 'D' for end measuring type.

†Non-preferred.

5.3 The scales shall be graduated in millimetres throughout the nominal length. The dividing lines shall be fine and clear, of uniform depth and thickness and perpendicular to the edges. The thickness of lines shall be not more than 0·2 mm for stamped and printed scales and 0·1 mm for engraved scales. The lines shall be of sufficient depth to maintain legibility and indelibility. The length of the lines shall be as follows:

	For 10-, 15- and 20-cm Scales	*For 30-, 50- and 100-cm Scales*
	mm	mm
cm mark	5	6
5-mm mark	3·5	4
1-mm mark	2·5	2·5

5.4 In the case of wooden scales, the lines shall be filled in black on natural background or with a suitable colour which shall contrast with the colour of the base to ensure legibility. In the case of plastic scales, the manufacturer shall have the option to choose the colour for the lines which shall contrast with the colour of the base to ensure legibility.

5.5 When the scales are made from transparent plastic material, the graduations shall be marked on the bottom face along the edges.

5.6 Each centimetre graduation shall be marked with appropriate numerals. In case the numeral consists of only one digit, it shall be marked on the left-hand side of the centimetre graduation. In case the numeral consists of two digits, these shall be placed on either side of the graduation. The height of the numerals shall be not less than 2·0 mm.

6. ACCURACY

6.1 The maximum cumulative error for the entire length of graduated part of the scale shall not exceed ± 0·50 mm when compared against a certified scale. Further, over any 10 cm length of the scale the maximum error shall not exceed ± 0·25 mm. For scales with unidirectional marking the zero mark on the opposite edges shall be within 0·1 mm.

7. DESIGNATION

7.1 Metric scales for general purposes shall be designated by the following:

a) Material and commonly used name,

b) Type — 'G' for edge measuring and 'D' for end measuring,

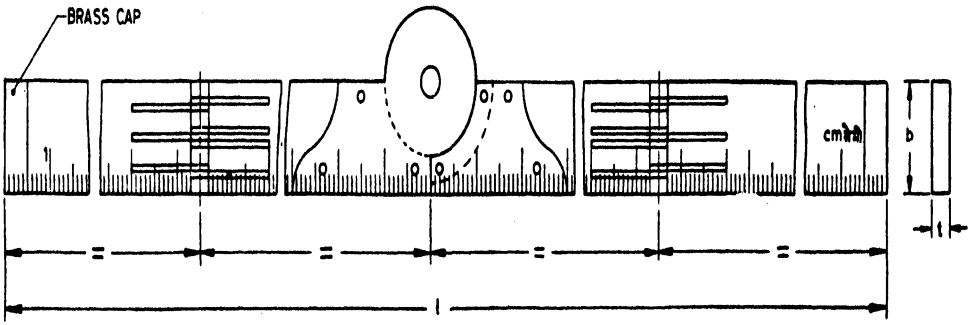
c) Size,

d) Method of marking — 'R' for reverse marking and 'U' for Unidirectional marking, and

e) The number of this standard.

TABLE 2 PRINCIPAL DIMENSIONS OF WOODEN FOLDABLE SCALES

(*Clause* 4.1)

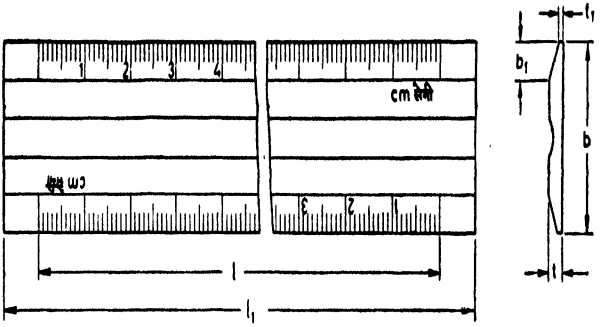


l	*b*		*c*
	Max	*Min*	
cm	mm	mm	mm
50	15	14·5	4 ± 1
100	20·0	19·0	5 ± 1

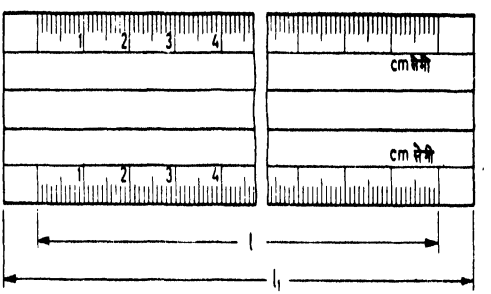
NOTE — Foldable scales are only end measuring type.

TABLE 3 PRINCIPAL DIMENSIONS OF PLASTIC SCALES

(Clause 4.2)



REVERSE MARKING



UNIDIRECTIONAL MARKING

TYPE		l_1		b		t	b_1	t_1
		Max	*Min*	*Max*	*Min*			
	cm	cm	cm	mm	mm	mm	mm	mm
G	10	11·0	10·5	27	22	3 ± 0·5	5 ± 1	1
G	*15	16·5	16·01	27	22	3 ± 0·5	5 ± 1	1
G	20	21·5	21·0	27	22	3 ± 0·5	5 ± 1	1
G	30	32	31·5	32	27	4 ± 0·5	5 ± 1	1

NOTE — Plastic scales are only edge measuring type.

*Non-preferred.

Examples:

1) A wooden end measuring (D) scale of 50 cm with reverse marking (R) shall be designated as:

Wooden Scale D50R — IS : 1480-1970

2) A wooden edge measuring (G) scale of 30 cm with unidirectional marking (U) shall be designated as:

Wooden Scale G30U — IS : 1480-1970

8. MARKING

8.1 The abbreviations 'cm' and 'सेमी' shall be marked at the end of the graduations of each scale.

8.2 Each scale shall be legibly and indelibly marked with the manufacturer's name.

8.3 The scales may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

9. PACKING

9.1 Each scale shall be wrapped in tissue paper or put in a polyethylene cover and the required quantity overwrapped in brown paper. Finally, they shall be packed in wooden case lined with waterproof paper or other suitable waterproof material.

BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002
Telephones: 323 0131, 323 3375, 323 9402
Fax : 91 11 3234062, 91 11 3239399, 91 11 3239382

Telegrams : Manaksanstha
(Common to all Offices)

	Telephone
Central Laboratory:	
Plot No. 20/9, Site IV, Sahibabad Industrial Area, SAHIBABAD 201010	8-77 00 32
Regional Offices:	
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg, NEW DELHI 110002	323 76 17
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